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FEDERAL COMMUNICATIONS COMMISSION  
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Before the  
FEDERAL COMMUNICATIONS COMMISSION  
Washington, D. C. 20554

In the Matter of

Amendment of Parts 5, 21, 22, 23, 25,  
73, 74, 78, 80, 87, 90, 94, 95 and 97 of)  
the Commission's Rules to Establish a  
Radio Astronomy Communications Zone  
in Puerto Rico

RM-8165

TO: The Chief, Policy and Rules Division

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COMMENTS OF THE AMERICAN RADIO RELAY LEAGUE, INCORPORATED

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THE AMERICAN RADIO RELAY  
LEAGUE, INCORPORATED  
225 Main Street  
Newington, CT 06111

Christopher D. Imlay  
Booth, Freret & Imlay  
1233 20th Street, N. W.  
Suite 204  
Washington, D. C. 20036  
(202) 296-9100

February 18, 1993

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## **SUMMARY**

The American Radio Relay League, Incorporated, (the League) submits its comments in response to the Petition for Rule Making by Cornell University (Cornell). Cornell proposes to require that all applicants for new and modified radio facilities in the Commonwealth of Puerto Rico or the surrounding islands provide written notification to the Arecibo Observatory in advance.

Though the League, and radio amateurs generally, support the mission of the Observatory at Arecibo, and acknowledges the need to protect the Observatory from actual interference within radio astronomy frequency allocations, Cornell should not be permitted to disrupt a mature telecommunications system in a highly populated area. Nor should a valuable emergency communications system in a hurricane-susceptible area be restricted, based on an inchoate, unquantified fear of possible future interference.

There is no allegation that any amateur station, including beacon or repeater stations, has or stands to cause harmful interference to the Arecibo Observatory. Amateur repeaters and beacons, inherently low-power devices, attenuate harmonic interference to a significant degree, and are unlikely to cause interference to the Observatory. Neither will the notification process sought to be implemented prevent interference from mobile, or intermittent spurious signals.

The petition provides no criteria for resolving interference claims, nor any criteria for the Commission to use, should its intervention become necessary. A better procedure would be for Cornell to work cooperatively with the local repeater, or frequency coordinator in Puerto Rico, who can assist in identifying and resolving any interference complaint. The League also sponsors local interference committees, who can assist the Observatory in locating and resolving sources of interference.

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TO: The Chief, Policy and Rules Division

**COMMENTS OF THE AMERICAN RADIO RELAY LEAGUE, INCORPORATED**

The American Radio Relay League, Incorporated, (the League), the national association of amateur radio operators in the United States, by counsel and pursuant to Section 1.405(a) of the Commission's Rules (47 C.F.R. §1.405(a)), hereby respectfully submits its comments in response to the "Petition for Rulemaking" (the petition) filed on or about November 30, 1992 by Cornell University (Cornell), operator of the Arecibo, Puerto Rico Observatory pursuant to a cooperative agreement with the National Science Foundation. The petition was placed on Public Notice January 19, 1993 by Report No. 1925. These comments are thus timely filed. The Cornell petition seeks amendment of numerous rules governing various radio services administered by the Commission, so as to require that all applicants for new communications facilities, and all modifications of existing authorizations anywhere in Puerto Rico or the surrounding islands, provide written notification to the Arecibo Observatory. In

opposition to the petition as stated, relative to the effect on the Amateur Radio Service, the League states as follows:

1. According to the Petition, Cornell wishes, by virtue of the notification and opposition procedure it seeks to establish, to permit the Arecibo Observatory to determine whether applications might cause harmful interference to the radio astronomy facilities there. If interference is anticipated, the proposed rule changes would permit Arecibo Observatory to file objections thereto with the Commission. As applied to the Amateur Radio Service, the notification procedure would permit the Observatory to determine, within 20 days of notification of the proposed installation of an amateur radio repeater or automatic beacon station (on frequencies allocated to the Amateur Radio Service), whether the repeater or beacon, at the location and operating parameters proposed, should be opposed. If an opposition is filed, the Commission would "review the objection" and take "appropriate action." There are no technical criteria proposed for such evaluation. Neither is the basis for a determination of "appropriate action" specified.

2. At the outset, it should be understood that the League supports the mission of Cornell at Arecibo. The scientific research professionally conducted by radioastronomers is akin to research work done as an avocation by many radio amateurs in the radio spectrum, and the work done at Arecibo is of interest to radio amateurs generally. Indeed, the League is pleased to note the considerable involvement of radio amateurs, in their professional capacities, at the Arecibo observatory since its inception. The

League does not dispute the need to protect the observatory from actual harmful interference within radio astronomy frequency allocations. Furthermore, to the extent consistent with reasonable, efficient operation of radio stations operating in their own frequency allocations, the observatory should be accommodated in conducting passive experiments in the radio spectrum generally. The research at Arecibo, though important and deserving of reasonable accommodation, should not, however, be permitted to disrupt mature telecommunications systems in a highly populated area, or deter or inhibit the modification of communications facilities with newer technologies. Nor, from the League's point of view, should a valuable emergency communications system in a hurricane-susceptible area be restricted, based on an inchoate, unquantified fear of possible future interference.

3. The Cornell petition is silent as to the degree of protection which should be accorded, or which Cornell would suggest, for the Arecibo Observatory. The petition has not made any case for the relief offered, in that not all radio services are shown to be potential interference sources. The notification requirements sought to be implemented are thus overbroad. Indeed, in determining whether a particular signal might be objectionable to the observatory, the only guidance offered by the technical statement attached to the petition is at page 4 thereof, as follows:

The dense broadcasting region has not prevented the Arecibo Observatory from obtaining valuable scientific data because the telescope is only looking upward. The telescope can only look at a 40-degree cone around the

zenith. The telescope cannot be pointed at the horizon like the conventional telescopes of the National Radio Astronomy Observatory in Green Bank, WV. Interfering signals do not enter the Arecibo system via the main beam or the near sidelobes but rather via the far sidelobes of the system.

The statement goes on to explain that planned upgrades to the antenna at Arecibo will further attenuate the sidelobes of the antenna and will reduce received interference. The factors mitigate, rather than justify, any need for the broad-based rule changes requested.

4. The technical statement addresses alleged conflicts between broadcast facilities in Puerto Rico and the Arecibo Observatory,<sup>1</sup> but it does not allege that there are now or have been any conflicts between amateur radio repeater or automatic beacon facilities (the only types of amateur facilities which would be affected by the petition) and the Observatory. Though it is impossible to determine from the petition, because the petition does not contain sufficient engineering to determine the extent of any potential conflict, the League believes that amateur repeater facilities and beacon facilities are not likely to cause any interference whatsoever to the Observatory. Amateur radio repeater stations principally utilize omnidirectional antennas, and operate at transmitter powers typically between 25 and 150 watts. They are

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<sup>1</sup> By contrast to amateur beacon and repeater facilities, where no impact on the Observatory has been shown, it is understandable that Cornell would be concerned about the installation of a 1.5 MW UHF Television facility with a second harmonic in a Radio Astronomy frequency allocation. The League takes no position on the merits of the petition with respect to broadcast facilities.

installed and modified routinely by radio amateurs, and no FCC approval is necessary before a repeater is installed or modified now. Beacon stations, used by radio amateurs for propagation research and frequency selection, operate using omnidirectional antennas and power levels of between 5 and 10 watts typically. Amateur repeaters and beacons operate from known fixed locations, and incorporate automatic transmitter identification circuitry. Rules regarding spurious emissions from amateur transmitters (See §§97.307(d) and (e) of the Commission's rules) are reasonably strict. A typical amateur VHF repeater is required to limit the mean power of spurious emissions to at least 60 dB below the mean power of the fundamental frequency. Most modern commercial repeater installations limit spurious emissions to a significantly greater extent than required. This, coupled with the low power levels at the fundamental frequency, the use of cavities in modern repeater installations, and the use of antennas which are not particularly broadbanded, greatly limit any potential interference from repeater or beacon stations.<sup>2</sup> The Amateur Radio Service also utilizes temporary repeaters as a component of its emergency communications preparedness plans. The preclusion, or inhibition of temporary

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<sup>2</sup> The island of Puerto Rico is, as the Commission is well aware, extremely mountainous. Notwithstanding the height of the elevated feed point of the antenna, there is significant terrain shielding to large, populous portions of the island. It is apparent that the suggestion that the entire island of Puerto Rico should be designated a radio quiet zone is overkill from a geographic standpoint. There appears no rationale for the designation of the Puerto Rico Communications Zone as "the islands of Puerto Rico, Desecheo, Mona, Vieques and Culebra" other than to make sure that everyone has the same notification burden.

fixed amateur facilities by a 20-day notification period is a difficult burden for public service-minded radio amateurs. The Cornell petition does not take any of these factors into account. It is thus overbroad and imposes unjustified burdens on the Amateur Radio Service.

5. Neither is it clear that the protection sought by Cornell in the petition could be afforded to the Observatory, given the geographic location of the antenna. No farther from the Observatory than some parts of the proposed quiet zone are substantial portions of the Atlantic Ocean and the Caribbean Sea, where shipboard stations and other interference sources could be located that could not be controlled by the Commission. Interference from aircraft in the airspace above and proximate to the dish is another intermittent interference source which cannot be protected against. Furthermore, according to the petition, the practical effect of alleged received interference at the Observatory to date is the need to make second observations to verify data. The petition does not account for the possibility of intermittent spurious signals, which would, even given the notification process sought by Cornell, necessitate second observations anyway. The burden to be placed on virtually all communications entities by the proposed notification process is apparent. The absence of any proposed criteria for evaluating, much less resolving interference claims, leaves the Commission licensee in a Kafkaesque posture. That burden is itself an intolerable environment for Puerto Rico communications entities, including



radio amateurs. What is not apparent, however, is the benefit to be derived from the notification exercise, given the ambient conditions in Puerto Rico.

6. The Cornell petition has not made a case for the notification procedure relative to amateur facilities. Perhaps, in areas immediately adjacent to the antenna, an amateur repeater or beacon station could have some potential effect on the facility, but that has not been established by the petition.

7. The League has an alternative suggestion, which would not unduly burden amateur radio, nor saddle the Commission with an additional burden of adjudication of allegations of potential or anticipated interference with no objective adjudication criteria.

The Amateur Radio Service has developed an extremely efficient arrangement for local frequency coordination, principally with respect to VHF and UHF repeaters. Local database administrators, often referred to as repeater or frequency coordinators, are active in most areas of the country, including Puerto Rico. This radio amateur or committee of amateurs, acting in a volunteer capacity, coordinates the location and frequency of repeaters in a given area so as to prevent repeater-to-repeater interference. The Commission has in the past given preference, in resolving repeater-to-repeater interference situations, to coordinated repeaters. It has thus endorsed the concept of volunteer frequency coordination in the Amateur Radio Service.<sup>3</sup> A reasonable alternative to the proposed

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<sup>3</sup> See §97.205(c) of the Commission's rules.

notification obligations with respect to the Amateur Radio Service would be for Cornell to coordinate informally with the local repeater coordinator. In so doing, Cornell can obtain information concerning amateur repeaters and beacons through a cooperative means. Such would avoid unnecessary notification, and delay of installation of new amateur repeater and beacon facilities, which are instrumental in amateur radio emergency communications efforts. The local coordinator will provide Cornell with a single point of contact, and the ability to identify any possible interference sources right away. He can also assist in resolving interference problems, should any actual interference arise.

8. In summary, the Cornell petition fails to justify the proposed notification procedure with respect to amateur radio facilities in Puerto Rico. It provides no mechanism by which an amateur could evaluate in advance whether a planned facility might trigger an opposition to a new or modified facility. There is no cited instance of amateur facilities causing interference to the Observatory, nor is there sufficient justification contained within the petition to conclude that a normal amateur repeater or beacon station properly operating in an amateur frequency allocation creates a significant potential for interference. New repeaters or beacon stations will have no interference profile sufficiently different from existing facilities to justify any anticipatory fear of interference. The notification procedure, its inherent delay, and the unspecified criteria for triggering an objection to the new or modified amateur facility proposed in the petition would inhibit

amateur radio emergency preparedness efforts; all for no useful purpose. The Commission's limited staff need not suffer the additional resource burden of adjudicating claimed future interference potential in the event of an opposition filed after notification. The absence of any proposed criteria of Commission adjudication of disputes between the Observatory leaves Commission staff, as well as communications licensees, in a vacuum. If there is a role for the Commission in the protection of the Arecibo Observatory, it comes into play only after the parties have attempted cooperatively to resolve an actual, harmful interference problem. The Amateur Radio Service has the ability to cooperatively resolve any such complaints, and that mechanism should be utilized.

9. If there is an actual interference problem involving amateur radio, the local frequency coordinator in Puerto Rico will be willing to cooperate in identification of the source of claimed interference, and its resolution as necessary. In addition, the League has established local interference committees which can be called upon by the Observatory to assist in locating sources of interference. Cornell thus has much to gain from a cooperative approach to interference resolution with the amateur community, as opposed to the adversarial procedure suggested in the petition. It is thus suggested that the Amateur Radio Service be viewed as an ally, and that its volunteer coordination and interference resolution resources be utilized cooperatively.

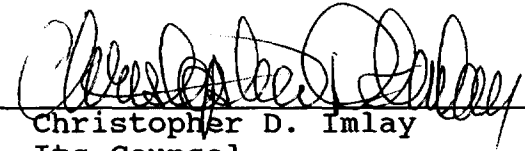
Therefore, the foregoing considered, the American Radio Relay League, Incorporated respectfully requests that the Commission

appropriately narrow the scope of the proposed rule changes in accordance with these comments, in any rule making proceeding initiated pursuant to Cornell's petition, and that the proposed modifications to §§ 97.3, 97.203 and 97.205 of the Amateur Radio Service Rules not be proposed or adopted.

Respectfully submitted,

**THE AMERICAN RADIO RELAY  
LEAGUE, INCORPORATED**

225 Main Street  
Newington, CT 06111

By   
Christopher D. Imlay  
Its Counsel

BOOTH, FRERET & IMLAY  
1233 20th Street, N. W.  
Suite 204  
Washington, D. C. 20036  
(202) 296-9100

February 18, 1993

**CERTIFICATE OF SERVICE**

I, Margaret A. Ford, Office Manager of the law firm of Booth, Freret & Imlay, do certify that copies of the foregoing COMMENTS OF THE AMERICAN RADIO RELAY LEAGUE, INCORPORATED were mailed via U. S. Mail, postage prepaid, first class, this 18th day of February 1993, to the offices of the following:

Christopher J. Reynolds, Esquire  
Post Office Box 2809  
Prince Frederick, MD 20678  
Counsel for Cornell University

  
Margaret A. Ford